

**Pediatric Intravenous Antimicrobial Dosing Guideline for Infants and Children >1 month of age**

Approved by the Antimicrobial Subcommittee and the Pharmacy and Therapeutics Committee 9/2016, Department of Pharmaceutical Services

**For assistance in antimicrobial dosing especially in patients with renal and hepatic failure contact the Antimicrobial Stewardship Pharmacist x77567, RRMC 5<sup>th</sup> floor pharmacy x77521**  
**For formal consultation and diagnosis and management recommendations contact the Pediatric ID Consult Service**  
**For empiric antimicrobial treatment guidelines visit <http://www.asp.mednet.ucla.edu>**

Doses are recommended for systemic infections commonly treated with these agents.

**Abbreviations** CF= cystic fibrosis, LD= loading dose, MD= maintenance dose, F/N= fever neutropenia, HAP= hospital acquired pneumonia, Osteo= osteomyelitis

DRUG	Creatinine Clearance (Cl <sub>cr</sub> ) >50mL/min/1.73m <sup>2</sup>	Creatinine Clearance (Cl <sub>cr</sub> ) 10-50mL/min/1.73m <sup>2</sup>	Creatinine Clearance (Cl <sub>cr</sub> ) ≤10mL/min/1.73m <sup>2</sup> (Not on dialysis)	ADULT MAXIMUM DOSE
<b>Acyclovir</b>	HSV neonate <3mo 20mg/kg/dose Q8H	Cl <sub>cr</sub> 25-50: 20mg/kg/dose Q12H Cl <sub>cr</sub> 10-24: 20mg/kg/dose Q24H	10mg/kg/dose Q24H	
	Dosing of acyclovir varies by immune status and indication. Please consult pediatric infectious diseases and/or pharmacy for dosing recommendations			
<b>ABLC Amphotericin B Lipid Complex</b>	5mg/kg/dose Q24H	No change	No change	
	Dosage reductions in renal disease not necessary. Due to nephrotoxic potential, reducing ABLC dose or holding drug may be warranted if serum Cr is rising.			
<b>Amikacin</b>	15mg/kg/dose Q24H*  CF 30mg/kg/dose Q24H*			
<b>Extended Interval dosing (preferred)</b>	*Check amikacin level 8 hours (6-14 hours) after start of 30 minute infusion of first dose  Dosing interval (q24H, q36H, q48H) dependent upon Extended Interval Level and reference to the Extended Interval Dosing Nomogram	Dosing interval (Q36H or Q48H) dependent upon Extended Interval Level and reference to the Extended Interval Dosing Nomogram	Do not use extended interval dosing Discuss with Pharmacy	
<b>Traditional Dosing</b>	7.5mg/kg/dose Q8H  CF 10mg/kg/dose Q8H	5-7.5mg/kg/dose Q 12-24H	2.5-5mg/kg/dose x 1 Monitor 24 hour level Target level <5 mcg/mL	
	For traditional dosing, obtain <b>Trough</b> within 30 min before the next dose and <b>Peak</b> 30 min after 30 min infusion. <b>Goal Peak: 25-35 mcg/mL. Goal Trough: &lt;5 mcg/mL</b>			
<b>Ampicillin</b>	50mg/kg/dose Q6H  Endocarditis 75mg/kg/dose Q6H  Meningitis 100mg/kg/dose Q6H	50mg/kg/dose Q6-12H  75mg/kg/dose Q6-12H  100mg/kg/dose Q6-12H	50mg/kg/dose Q12H  75mg/kg/dose Q12H  100mg/kg/dose Q12H	<b>Uncomplicated Infection</b> 1-2g Q4H  <b>Meningitis, Endovascular Source</b> 2g Q4H
<b>Ampicillin-sulbactam</b>	50mg ampicillin/kg/dose Q6H	Cl <sub>cr</sub> 15-30: 50mg ampicillin/kg/dose Q12H	50mg ampicillin/kg/dose Q24H	2g ampicillin Q6H
<b>Caspofungin</b>	LD 70mg/m <sup>2</sup> /dose x1 dose, then  MD 50mg/m <sup>2</sup> /dose Q24H	No dose adjustment needed for renal dysfunction  Adjustment needed for severe hepatic dysfunction: 70mg/m <sup>2</sup> /dose x1, then 35mg/m <sup>2</sup> /dose Q24H		LD 70mg x1 dose then,  MD 50mg Q24H
<b>Cefazolin</b>	25-50mg/kg/dose Q8H	Cl <sub>cr</sub> 10-30: 12.5-25mg/kg/dose Q12H	12.5-25mg/kg/dose Q24H	2g Q8H
<b>Cefepime</b>	50mg/kg/dose Q8H	Cl <sub>cr</sub> 30-50: 50mg/kg/dose Q12H Cl <sub>cr</sub> 11-29: 50mg/kg/dose Q24H	25mg/kg/dose Q24H	2g Q8H
<b>Cefotaxime</b>	50 mg/kg/dose Q6H	Cl <sub>cr</sub> <20: 25 mg/kg/dose Q6H	No change	2g Q4H
<b>Ceftriaxone</b>	50-75mg/kg/dose Q24H  Meningitis 50mg/kg/dose Q12H  Endocarditis 100mg/kg/dose Q24H	No change	No change	1g Q24H  Meningitis 2g Q12H  Endocarditis 2g Q24H
<b>Ciprofloxacin</b>	15mg/kg/dose Q12H  F/N, CF 10mg/kg/dose Q8H	Cl <sub>cr</sub> 10-30: 15mg/kg/dose Q24H	15mg/kg/dose Q24H	400mg Q12H  F/N, CF 400mg Q8H
<b>Clindamycin</b>	10mg/kg/dose Q8H  Osteo, Pneumonia 13mg/kg/dose q8H	No change	No change	900mg q8H
<b>Doxycycline</b>	2mg/kg/dose Q12H	No change	No change	100mg Q12H
<b>Fluconazole</b>	LD 6-12mg/kg/dose x1 dose, then MD 3-12mg/kg/dose Q24H  Prophylaxis 3-6mg/kg/dose Q24H	3-6mg/kg/dose Q24H  No change	3-6mg/kg/dose Q24H  No change	LD 800mg Q24H then MD 400mg Q24H  Prophylaxis 200mg-400mg Q24H
<b>Ganciclovir Induction</b>	Cl <sub>cr</sub> ≥70: 5mg/kg/dose Q12H  Cl <sub>cr</sub> 50-69: 2.5mg/kg/dose Q12H	Cl <sub>cr</sub> 25-49: 2.5mg/kg/dose Q24H  Cl <sub>cr</sub> 11-24: 1.25mg/kg/dose Q24H	1.25mg/kg/dose x3/week	
<b>Maintenance</b>	Cl <sub>cr</sub> ≥70: 5mg/kg/dose Q24H  Cl <sub>cr</sub> 50-69: 2.5mg/kg/dose Q24H	Cl <sub>cr</sub> 25-49: 1.25mg/kg/dose Q24H  Cl <sub>cr</sub> 10-24: 0.625mg/kg/dose Q24H	0.625 mg/kg/dose x3/week	
<b>Gentamicin</b>	7 mg/kg/dose Q24H*  CF 10mg/kg/dose Q24H*	Cl <sub>cr</sub> 40-59: 7 mg/kg/dose Q36H Cl <sub>cr</sub> 20-39: 7 mg/kg/dose Q48H  CF 10mg/kg/dose Q36H*		
<b>Extended interval dosing (preferred)</b>	Hematology/Oncology 6mo-<9yrs: 10 mg/kg/dose Q24H* 9yrs - <12yrs: 8 mg/kg/dose Q24H* ≥12yrs: 7 mg/kg/dose Q24H*  *Check a gentamicin level 8H (6-14H) after start of infusion of first dose  Dosing interval (q24H, q36H, or q48H) dependent upon Extended Interval Level and reference to the Extended Interval Dosing Nomogram	Hematology/Oncology 6mo-<9yrs: 10 mg/kg/dose Q36H* 9yrs - <12yrs: 8 mg/kg/dose Q36H* ≥12yrs: 7 mg/kg/dose Q36H*	Do not use extended interval dosing, call pharmacy	
<b>Traditional Dosing</b>	2.5mg/kg/dose Q8H  CF 3.3mg/kg/dose Q8H  Synergy 1mg/kg/dose Q8H	Cl <sub>cr</sub> 40-50: 2.5mg/kg/dose Q12H Cl <sub>cr</sub> 20-39: 2.5mg/kg/dose Q24H Cl <sub>cr</sub> <20: Loading dose, then monitor levels every 12-24 hours, target: level ≤1 mcg/mL	Loading dose, then monitor levels every 12-24 hours, target: level ≤1 mcg/mL	
	For traditional dosing, obtain <b>Trough</b> within 30 min before the next dose and <b>Peak</b> 30 min after 30 min infusion. <b>Goal Peak: 8-10 mcg/mL, synergy 3-4 mcg/mL. Goal Trough: &lt;1 mcg/mL</b>			

DRUG	Creatinine Clearance (Cl <sub>cr</sub> ) >50mL/min/1.73m <sup>2</sup>	Creatinine Clearance (Cl <sub>cr</sub> ) 10-50mL/min/1.73m <sup>2</sup>	Creatinine Clearance (Cl <sub>cr</sub> ) ≤10mL/min/1.73m <sup>2</sup> (Not on dialysis)	ADULT MAXIMUM DOSE
Levofloxacin	<5yo: 10mg/kg/dose Q12H ≥5yo: 10mg/kg/dose Q24H	Cl <sub>cr</sub> 10-29 <5yo: 10mg/kg/dose Q24H ≥5yo: 10mg/kg/dose Q48H	10 mg/kg/dose x1 dose then 5-7 mg/kg/dose Q48H	750mg Q24H
Linezolid	<12yo: 10mg/kg/dose Q8H ≥12yo: 10mg/kg/dose Q12H	No change	No change	600mg Q12H
Meropenem	20mg/kg/dose Q8H  Meningitis, CF 40mg/kg/dose Q8H	Cl <sub>cr</sub> 30-49: 20mg/kg/dose Q12H Cl <sub>cr</sub> 10-29: 10mg/kg/dose Q12H  Cl <sub>cr</sub> 30-49: 40mg/kg/dose Q12H Cl <sub>cr</sub> 10-29: 20mg/kg/dose Q12H	10mg/kg/dose Q24H  20mg/kg/dose Q24H	1g Q8H  Meningitis, CF 2g Q8H
Metronidazole	10mg/kg/dose q8H	No change	10mg/kg/dose Q12H	500mg Q8H
Oxacillin	33mg/kg/dose Q4H  200mg/kg/day (Continuous Infusion)	No change	No change	2g Q4H
Penicillin G	100,000-250,000 units/kg/DAY ÷ Q4H  Severe infections 250,000-400,000 units/kg/DAY ÷ Q4H	75,000-175,000 units/kg/DAY ÷ Q4H  175,000-300,000 units/kg/DAY ÷ Q4H	50,000-125,000 units/kg/DAY ÷ Q6H  125,000-200,000 units/kg/DAY ÷ Q6H	4 million units Q4H
Piperacillin-tazobactam	50-75mg piperacillin/kg/dose Q6H*  CF, Pseudomonas, HAP 100mg piperacillin/kg/dose Q6H*  *infuse first dose over 30 min, then subsequent doses over 4 hours	Cl <sub>cr</sub> 30-50: 50mg piperacillin/kg/dose Q6-8H Cl <sub>cr</sub> <30: 50mg piperacillin/kg/dose Q8H  CF, Pseudomonas, HAP Cl <sub>cr</sub> 30-50: 100mg piperacillin/kg/dose Q6-8H* Cl <sub>cr</sub> <30: 50mg piperacillin/kg/dose Q8H*  *infuse first dose over 30 minutes then subsequent doses over 4 hours	50mg piperacillin/kg/dose Q8H	4.5g Q6H
Rifampin	5-10mg/kg/dose Q12H	No change	No change	600mg Q24H
Tobramycin	See Gentamicin	See Gentamicin	See Gentamicin	
Trimethoprim (TMP)-Sulfamethoxazole	Mild to moderate systemic Infections 5mg TMP/kg/dose Q12H  Pneumocystis Pneumonia, Stenotrophomonas maltophilia, Serious infection 5mg TMP/kg/dose Q6-8H	Cl <sub>cr</sub> 15-30: 2.5mg TMP/kg/dose Q12H  Cl <sub>cr</sub> 15-30: 5mg TMP/kg/dose Q8-12H	5mg TMP/kg/dose Q24H  5mg TMP/kg/dose Q12-24H	
Vancomycin	15mg/kg/dose Q6H  Obtain trough 30 min before 4 <sup>th</sup> dose. For uncomplicated infections goal trough 10-15 mcg/L. For meningitis, pneumonia, osteo, severe infection goal trough 15-20 mcg/L	15mg/kg/dose Q8H	15mg/kg/dose Q12H	1g q6H
Voriconazole	LD 6-9mg/kg/dose Q12H x2 doses, then MD 4-9mg/kg/dose Q12H	No adjustment for renal dysfunction. The IV formulation should be avoided if possible if CrCl<50mL/min due to the accumulation of the IV vehicle.  Draw trough level ( ≤30 min before next dose) only after 5-7 days of treatment.		LD 400mg Q12H x2 doses, then MD 200mg Q12H

Creatinine clearance estimated using the Schwartz's equation

$$K \times L/S_{cr} = Cl_{cr} = \text{creatinine clearance in mL/min/1.73m}^2$$

L= height or length in cm  
Scr= serum creatinine concentration in mg/dL  
K= Age specific constant of proportionality

Age	K
Pre-term infants up to 1yr	0.33
Full-term infants up to 1 yr	0.45
1-12 yrs	0.55
13-21 yr female	0.55
13-21 yr male	0.7
1-16 yr w/ chronic kidney disease	0.41

### Mattel Children Hospital UCLA Pediatric INPATIENT ABBREVIATED SUSCEPTIBILITY DATA 2016

See UCLA Guidebook for complete antibiogram: <http://www.asp.mednet.ucla.edu/pages/anti-suscep-summ>

For additional microbiological information call UCLA Clinical Microbiology x42757

R- resistant, AMIK- amikacin, AMP- ampicillin, A/S- ampicillin/sulbactam, CIP- ciprofloxacin, CLIN- clindamycin, CZOL- cefazolin, CTRX- ceftriaxone, CFPM- cefepime, DOX- doxycycline, ERT- ertapenem, ERY- erythromycin, GEN- gentamicin, MER- meropenem, NIT- nitrofurantoin, OX- oxacillin, PCN- penicillin, P/T- piperacillin-tazobactam, RIF- rifampin, TOB- tobramycin, T/S- trimethoprim/sulfamethoxazole, VANC- vancomycin

#### Gram Negative Isolates (% strains susceptible)

Organism	Source	No. Isol	AMP	A/S	CZOL	CTRX	P/T	CFPM	MER	AMIK	GEN	TOB	CIP	T/S	NIT
<i>Enterobacter cloacae</i>	NU	22*	R	R	R	- <sup>1</sup>	- <sup>1</sup>	96	99	99	99	99	99	91	-
	U	20*	R	R	R	- <sup>1</sup>	- <sup>1</sup>	95	99	99	99	ND	99	85	26
<i>Escherichia coli</i>	NU	45	31	43	53	77	96	84	98	99	89	86	66	58	-
	U	407	60	67	93	95	ND	ND	99	99	93	ND	89	77	95
<i>Klebsiella pneumoniae</i>	NU	42	R	81	81	88	91	88	98	98	88	88	86	81	-
	U	47	R	79	89	92	ND	ND	99	99	92	ND	98	85	21
<i>Proteus mirabilis</i>	U	46	83	87	96	98	ND	ND	99	99	89	ND	99	74	R
<i>Serratia marcescens</i>	NU	18*	R	R	R	- <sup>1</sup>	94	99	99	99	99	99	94	99	-
<i>Acinetobacter baumannii</i>	NU	5*	R	80	R	R	60	80	99	99	99	99	99	99	-
<i>Pseudomonas aeruginosa</i>	NU	81	R	R	R	R	80	86	94	98	95	98	89	R	-
	U	30	R	R	R	R	ND	87	90	99	97	97	90	R	R

Source: NU= non urine, U=urine, No. Isol = number of isolates, ND = no data

\* Calculated from fewer than the standard recommendation of 30 isolates

<sup>1</sup> Not appropriate for treatment of serious *Enterobacter cloacae* or *Serratia marcescens* infections

#### Gram Positive Isolates (% strains susceptible)

Organism	Loc	No. Isol	PCN	OX	AMP	CTRX	CIP	CLIN	DOX	ERY	RIF	T/S	VANC
<i>Staphylococcus aureus</i>	OP	191	<10	82	-	-	78	76	99	55	99	99	99
	IP	95	<10	79	-	-	79	88	99	69	99	99	99
MRSA	OP	39	0	0	-	-	19	76	99	6	97	97	99
	IP	29*	0	0	-	-	26	90	99	32	99	99	99
MSSA	OP	154	<10	100	-	-	90	75	99	64	99	99	99
	IP	67	<10	100	-	-	92	84	99	78	99	99	99
<i>Coagulase negative Staphylococcus (CONS)</i>	OP	26*	<10	50	-	-	87	67	95	32	97	68	99
	IP	39	<10	25	-	-	73	39	96	23	99	79	99
<i>Streptococcus pneumoniae</i>	All	16*	-	-	- <sup>1</sup>	-	-	94	81	81	-	69	100
			100	-	-	100	-	-	-	-	-	-	-
		69	-	-	100	-	-	-	-	-	-	-	-
<i>Enterococcus spp.</i>	All	53	-	-	85	-	74	-	44	-	51	-	87
<i>E. faecalis</i>	All	10*	-	-	99	-	92	-	23	-	62	-	99
<i>E. faecium</i>	All	5*	-	-	17	-	0	-	50	-	0	-	17
<i>Viridans group Streptococcus</i>	All	8*	64	-	-	79	-	-	-	-	-	-	100

Location= LOC: OP= outpatient, IP= inpatient, No. Isol = number of isolates

\* Calculated from fewer than the standard recommendation of 30 isolates

<sup>1</sup> 100% of isolates are susceptible to amoxicillin